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COMMONWEALTH MYCOLOGICAL INSTITUTE
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PLANT DISEASE NOTES.

CEREALS AND GRASSES.

PINK WHEAT GRAINS:

As reported by the writers (Proc.Linn.Soc,N.S.W., 77:307-322, 323-330,1952) Helminthosporium tritici-repentis was responsible for almost all of the pink or reddish discoloration of wheat grain observed in N.S.W. in 1949 and 1950. The position in 1951 and 1952 proved to be similar and numerous samples from the northern half of the state showed such discoloration.

The reason for the predominance of the grain discoloration, and the leaf spot phase of the disease as well, in the northern half of the state is not clear. It may be that climatic factors are more favourable for its development there than in the southern half of the wheat belt, or that the varieties grown are more susceptible than those most popular in the south.

In the original report (Proc.Linn.Soc.N.S.W. 77: 323-330,1952) it was stated that the perfect stage of the causal fungus (Pyrenophora tritici-repentis) had been found only once in culture. Subsequently however it has developed in a freshly isolated culture exposed to daylight at room temperature. Cultures kept in the dark at room temperature over the same period did not develop the perfect stage.

University of Sydney and N.S.W. Department of Agriculture. - DOROTHY E. SHAW AND P.G. VALDER.

LEAF SMUT, ENTYLOMA ORYZAE, FROM NEW GUINEA:

Specimens of diseased rice from New Guinea were recently examined and found to be heavily infected with Entyloma oryzae (E. lineatum.)

The diseased crop was at Dylup, near Madang, on the north-east coast, and this is apparently the first record of the disease in New Guinea.

Faculty of Agriculture, University of Sydney. - DOROTHY E. SHAW.

FIELD AND FODDER CROPS.

FRENCHING OF TOBACCO AT KATHERINE, N.T:

During the past five years small plots of tobacco have been grown on the C.S.I.R.O. Research Station at Katherine, N.T. and mild symptoms of frenching were observed on a few plants in most of these plots. All were grown under irrigation. In 1952, the area planted was increased to four acres, the layout providing for testing the levee soils at different distances from the river bank. Frenching was mild or absent in plants grown on the more sandy soils near the river but tended to be severe and common elsewhere. Soil differences appeared slight but clay and silt content increased with distance from the river.

Frenching is one of the earliest reported maladies of tobacco but its cause has not yet been determined. It is generally considered to be due to a soil deficiency or a toxin which affects protein metabolism and causes loss of apical dominance together with the formation in severe cases of numerous strap or shoe string leaves.

C.S.I.R.O., Canberra. - A.V. HILL.

VEGETABLES.

ASCOCHYTA DISEASE OF CLIMBING BEANS:

During February, 1953, specimens of Blue Lake climbing beans (Phaseolus vulgaris L.) showing severe leaf spotting and stem lesions were received from Batlow, N.S.W. The leaf spots were roughly circular 4-8 mm. in diameter with a marginal greyish zone surrounding a brown central area, and showed the development of many minute dark fruiting bodies. On the undersides of the leaves these spots had a tendency to run as black lesions along the veins, giving a leaf symptom similar to that caused by the bean anthracnose organism Colletotrichum lindemuthianum (Sacc & Magn. Bri. & Cav.). On petioles and stems, lesions were elongated, dark brown in colour and sunken, and often ran for distances up to 3-4 cm. along the stem. Some small dark spots were present on a few of the pods.

Examination of the spots revealed the presence of many dark walled pycnidia, containing masses of hyaline spores which oozed out in a long cirrus in water. These spores were very variable in septation and size, the majority having only one transverse septum but several with from 0 to 3 transverse septa were also seen. The size varied from 12 x 3.5 to 24 x 8 µ

(mean of 10 measurements 20 x 5 /u). The organism is a species of Ascochyta and it appears to agree with the description of Ascochyta boltshauseri Sacc. given by Sprague (Phytopath. 25: 416-420, 1935). This disease has been recorded in the Batlow district during the Autumn for the last three or four years but so far has not been found elsewhere in New South Wales. It causes much damage to beans in Holland, where it develops best under cool and moist conditions. This is probably one of the main factors limiting its distribution in N.S.W. The author would be interested to hear of records of any similar Ascochyta diseases of beans from other States.

Department of Agriculture, Sydney. - J. WALKER.

BEAN ANTHRACNOSE:

The resistance of various bean selections to several isolates of the bean anthracnose fungus (Colletotrichum lindemuthianum) is at present being tested and cultures of this organism from various parts of Australia, with details of variety being attacked and severity of infection, would be appreciated.

Department of Agriculture, Sydney. - J. WALKER.

ORNAMENTALS.

BACTERIAL GALL OF OLEANDER:

During February, 1953, specimens were received of the bacterial gall disease of oleander (Nerium oleander L.) caused by Pseudomonas savastanoi var. nerii. Although this disease is not common in New South Wales, on those occasions when it has been recorded the damage has been severe; leaves, twigs and buds being malformed with rough galls produced on them.

The disease can be spread through pruning cuts and other wounds and in rain splash, but these avenues do not seem to explain fully its spread in nature. The closely related olive knot (Ps. savastanoi) which does not occur in Australia, has an interesting association with an insect, the olive fly. The bacterium is symbiotically associated with the insect in the four

blind ducts of the mid-gut and during the process of oviposition is introduced into the plant with the egg. Gäumann (Principles of Plant Infection pp. 127-129, Eng. Ed., 1950) states that this association between the bacterium and the vector is an obligate one; "without bacteria, the vector cannot develop and, without the vector, there is no further spread of the bacteria". It would be of interest if a similar relationship between the oleander gall bacterium and a fly could be established. Many flies of the family Trypetidae (to which the olive fly belongs) are known to harbour symbiotic bacteria (Leach, J.G.: Insect Transmission of Plant Diseases p. 194, 1940) and it may be that a similar vector is concerned in the case of the oleander gall.

Department of Agriculture,
Sydney.

- LILIAN R. FRASER AND J. WALKER

MISCELLANEOUS NOTES.

SCLEROTIUM ROLFSII IN TANNING BARK:

Recently, a sample of tanning bark, in which potted orchids were beginning to develop a stem and collar rot condition, was found to be heavily infested with sclerotia of Sclerotium rolfsii. The sclerotia were reported to have been present in the tanning bark when it was delivered to the grower concerned, but were mistaken for clover seeds. The abundance of sclerotia indicates that tanning bark, like compost (Magee, N.S.W. Dep.Agric.Gaz. 58: 265-267, 1947), is a favourable medium for the development of S. rolfsii. This might reasonably be expected in view of the preference of this fungus for well aerated conditions, of its tolerance of high acidity and its ability to utilize cellulose (Rosen & Shaw. Jour.Agric.Res. 39: 41-46, 1929).

Department of Agriculture, Sydney. - F.C. BUTLER

CEREBELLA ANDROPOGONIS ASSOCIATED WITH CLAVICEPS PURPUREA ON WHEAT X RYE HYBRIDS:

For many years rye has been inoculated with conidia of Claviceps purpurea produced in culture, at the Sydney University Plot, and ergots have been produced on the ears. Waterhouse (in press) has also obtained ergots on the F1 plants of wheat x rye inoculated with conidia from culture.

In the season 1952, Cerebella andropogonis occurred for the first time in the Plot, associated with Claviceps purpurea on the wheat x rye hybrids. Normal ergots occurred on the rye and the hybrids.

The black stromatic bodies of the fungus are up to 1 cm. in length, deeply convoluted, and composed of masses of light brown spores, in groups of 2-6. The spores germinate readily in water to produce vigorous, branched, septate mycelium. Cultures established on P.D.A. are dark brown in colour, with tufts of brown-white mycelium over the surface. The medium becomes deep brown in colour, and after 3 weeks sporodochia nearly 1 cm. across, with masses of spores, are produced on the surface. E.W. Mason (personal communication) regards the species as C. andropogonis Cess.

From the time of the Tulasnes, species of Cerebella has been known to be associated with Claviceps spp., and some workers have regarded the Cerebella as parasitic on the Claviceps. A few others, notably Langdon (Phytopath. 32:613-617, 1942) have found no evidence of any parasitism of Claviceps by Cerebella. Langdon stated (after experimentation with Cerebella and Claviceps from grasses) that Cerebella is no more than a saprophyte that finds any carbohydrate-rich substratum suitable for growth, and noted that it has been recorded in various places in association with the attacks of the coffee-borer beetle, and on the seeds of chestnut, oak and Abies, i.e., without the presence of ergot. He recommended the removal of Cerebella species from host indices.

Facalty of Agriculture - Dorothy E. Shaw.
University of Sydney

YELLOW DWARF VIRUS OF TOBACCO IN TOMATO AND DATURA SP:

Natural occurrence of yellow dwarf virus of tobacco in tomato and datura has been observed at Canberra during several seasons and the presence of the virus confirmed by grafting scions to healthy tobacco plants. Infected Datura sp. commonly occur in areas where tobacco becomes infected and have also been collected in other districts, e.g. Canowindra, N.S.W. An infected tomato plant was received from Hawkesbury Agricultural College this season.

On datura symptoms are distinctive, but general chlorosis due to water shortage tends to masking. The indication from field observations is that yellow dwarf of tobacco is widespread and its occurrence on tomato is of interest. Young leaflets show greening along veins and slight chlorosis between veins, downward bending of the tips of the young apical leaflets and slight rolling under of the margins. Some of the older leaflets, at a later stage of infection, show a moderate thickening and rugosity. Bending of the tips and rolling under of margins might persist in some leaves. The inflorescence does not appear to be affected and plants set apparently normal but smaller fruit. Effect of the virus on yield has not been determined.

The jassid vector (Orosius argentatus) has a wide host range including both annuals and perennials and commonly occurs on mallow, datura, capeweed, crowfoot, white and subterranean clover and burr medic. In one experiment jassid populations and the number of infected plants were reduced, in tobacco, by the use of DDT spray but not sufficiently to make such treatments economic. Information on the extent to which tomato plantations, particularly in irrigation areas, become infected is not available, nor has the economic importance of

the disease in tomatoes been investigated.

C.S.I.R.O., Canberra. - M. MANDRYK.

TWO WEED RUSTS.

During January, 1953, collections of mat grass (Hemarthria uncinata R. Br.) and swamp dock (Rumex brownii Campd.) showing the development of rust were made in the Bega district of New South Wales. In both cases, sori were present only on the leaves and were heavily parasitised by Darluca filum Cast. With the mat grass rust, only uredosori were seen and from these the organism was determined as Puccinia cacao Mc Alp. This fungus was recorded on mat grass from Victoria and Queensland by McAlpine (The Rusts of Australia pp.117-118, 1906).

Both uredospores and teleutospores were found with the dock rust and it was readily identified as Puccinia ludwigii Tepp. (Mc Alpine pp. 174-175). This organism has previously been recorded in N.S.W. on leaves of Mexican dock (Rumex hymenocephalus Torr.).

As far as can be determined, this is the first record of both of the above diseases in New South Wales.

Department of Agriculture. Sydney. - J. WALKER.

TESTS WITH NEW FUNGICIDES:

When samples of new fungicides became available last season, tests were commenced on a number of diseases which have proved refractory to treatment. The following preliminary results are of interest:
Early blight (Alternaria solani) is the most serious disease of tomatoes in the Geraldton region and probably also of potatoes throughout the State. The effectiveness of foliage sprays for disease control was tested on tomatoes at Geraldton and potatoes at Coogee with the following relevant results which represent average plot yields in pounds of first grade fruit or tubers. The tomatoes were sprayed twelve times during growth and the potatoes four times towards the end of the season.

Tomatoes Control 15.75 Bordeaux 31.0 Phygon 40.0 (P. 01 = 7.15)

Potatoes " 40.0 " 42.3 " 32.4 Zineb 55.0

(P. 01 = 10.3)

Both Bordeaux mixture and Phygon were effective on tomatoes but the latter was outstanding, producing a 29% higher yield than the standard copper spray. Zineb was not available for the tomato experiment but on potatoes it was the only effective spray. It delayed the death of tops for about three weeks and gave a 30% higher yield (= 4 tons per acre approx.) than Bordeaux mixture. The copper spray proved phytotoxic on both host plants which explains in part its inferior performance. The ineffectiveness of Phygon on potatoes in contrast to tomatoes was unexpected and will be further investigated.
Anthracnose of grapes (Elsinoe ampelina) is a disease of major importance to vignerons in the Swan Valley and is difficult to control even with routine copper sprays. In large scale unreplicated plots this season Ziram gave spectacular control of cane and leaf infections and both Thiram and S.R.406 appeared to be superior to Bordeaux mixture. Phenyl mercury fixtan, however, was inferior to the copper spray.

Department of Agriculture, - W.P. CASS SMITH.
Perth.

SOME DISEASES OF INTEREST TO FORESTERS AND WOOD TECHNOLOGISTS:

CLAVARIA CRISTATA ON BATTERY SEPARATOR MATERIAL.

Sporophores of an organism closely corresponding to Clavaria cristata (Holmsk.) Fries and C. subrugosa Clel. have been noted on klinkii pine (Araucaria klinkii. Lauterb.) battery separator material stored under damp conditions. These two species are considered by Coker to be forms of C. cristata. It is interesting to note the attack by Clavaria on a manufactured article.

DALDINIA CONCENTRICA ON GEISSOIS BIAGIANA.

Black, charcoal-like fruiting surfaces on boards of Geissois biagiana v Muell. shipped from North Queensland and stored in a timber yard in the Sydney area were found to be due to attack by the ascomycete Daldinia concentrica (Bolt.) Ces & de Not. The fungus had penetrated the timber deeply and when planed it showed the characteristic dark brown streaks and lines described by European mycologists.

POLYPORUS DRYADEUS ON EUCALYPTUS STELLULATA.

Sporophores of a polypore corresponding both morphologically and culturally to Polyporus dryadeus (Pers.) Fries have been found on black sallee (Euc.stellulata Sieb.) at elevations of 4000 feet in the Nundle-Hanging Rock State Forests. As far as could be ascertained the fungus appears to prefer the cold, wet, higher elevations of this area, where it has been noted for many years.

SCHIZOPHYLLUM COMMUNE FRIES.

A small sporophore of Schizophyllum commune Fries has been found on a young seedling of hoop pine (Araucaria cunninghamii Ait.) from the Roseberry Forest Nursery and cultures of this organism have been obtained also from several other dying seedlings sent from the same nursery. It is possible that the attack is secondary to Fusarium root damage.

S. commune has also been noted on the New Guinea timbers, New Guinea rosewood (Pterocarpus indicus Willd.) and Papuadendron sp. In some cases the sporophores developed after several months storage under adverse conditions in the Sydney area, but small sporophores have also been detected on logs discharged from ship to bay.

Forestry Commission.
Sydney.

- D.W. EDWARDS.

COMMONWEALTH MYCOLOGICAL INSTITUTE NOTES.

DISTRIBUTION MAPS OF PLANT DISEASES:

This valuable series of maps has now been published over a period of more than ten years. Two hundred and sixty-two maps have been issued up to November, 1952. A cumulative index of 240 maps arranged separately under pathogens and hosts was issued in March last year, and in July a consolidated list of additions and corrections to maps 1 to 240 was added, greatly improving reference to the maps. Several second editions of maps were also issued during the year.

HOUSING OF C.M.I:

The Director in his report for 1951-52 which has now been published, refers to the fact that the additional accommodation comprising four rooms and cellars provided by the houses on Kew Green purchased in 1950 are proving invaluable to the Institute. Without this accommodation it would not have been possible to avoid the publication section becoming disorganised, for sales of publications have increased sixfold in the last ten years. Most of the abstracting staff are now accommodated at 61 Kew Green and this has enabled space to be found for visitors, "though even now some visitors prefer to work elsewhere when they see the crowded conditions under which we have to work and the inadequate accommodation we can afford them."

Plans are afoot, however, to improve the position. Approval is being sought from member governments for the Executive Council of C.A.B. to negotiate a loan of £55,000 from the U.K. Government for a new building for C.M.I., each Government to take a share, according to its contribution.

C.A.B. LIST OF RESEARCH WORKERS:

At the last Meeting of the Executive Council of the Commonwealth Agricultural Bureaux it was decided that in future editions of the List of Research Workers the classification of research workers by key subject numbers should be discontinued as this classification was of doubtful value and was the cause of errors which detracted from the value of the publication.

Department of Agriculture. - C.J. MAGEE.
Sydney.